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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,500	01/23/2004	Robert D. Varrin JR.	030157-0304884	5230

909 7590 03/23/2006

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EXAMINER
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WEBB, GREGORY E

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/762,500	Applicant(s) VARRIN ET AL.	
	Examiner Gregory E. Webb	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1</u> | 6) <input type="checkbox"/> Other: _____  |

*[Signature]*  
3/15/06

**DETAILED ACTION*****Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-21 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 6,740,168. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claims are generally broader than those claims of the '168 patent. The '168 patent requires the inclusion of nonionic surfactants whereas the instant claims more broadly describe the invention by not requiring this component.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Banks (US4045253).

Concerning the claimed method of removing scale, steam generator and the claimed scale, Banks teaches the following:

In the operation of heat transfer equipment incrustations of contaminants in the form of scale usually are formed on the surfaces thereof. Scale formation is especially troublesome in heat transfer equipment having surfaces in contact with water and steam, for example, industrial water heating and steam generation equipment, despite the fact that in many instances the water employed in such equipment is relatively pure. The incrustations formed on the surfaces in contact with water and steam can include deposits of copper and iron oxide and certain inorganic salts. Since scale can substantially reduce the heat transfer characteristics of the equipment, it is conventional practice to periodically remove the incrustated scale from the surfaces by known chemical cleaning processes.(see col. 1, lines 10-25)

Concerning the claimed chelant, Banks teaches the following:

Table 1D includes all runs in Table 1 involving the use of 1-hydroxyethylidene-1,1-diphosphonic acid, the sodium salt of

ethylenediaminetetraacetic acid, and the sodium salt of gluconic acid.(see table 1D)

Concerning the claimed reducing agent, Banks teaches the following:

In preparing the passivating solution, it is preferred that the base material be added to the water to form a base solution; thereafter, add the hydrazine to the base solution of the complexing agent to the base solution. Where the passivating solution contains both hydrazine and a complexing agent, it is desired, but not required, that the complexor be added to the base solution prior to the addition thereto of the hydrazine.

In an alternative method, the base and the hydrazine can be added simultaneously to the water; however, the hydrazine should not be mixed directly with an inorganic base. Hydrazine can be directly mixed with an organic base, such as for example, triethanolamine.(see col. 5, lines 53-60)

Concerning the claimed pH control agent, Banks teaches the following:

Table 1C includes all the runs in Table 1 involving triethanolamine. Table 1C clearly shows the effects of a combination of triethanolamine and hydrazine, both alone and in combination with one of sodium hydroxide, sodium carbonate, and sodium borate to obtain satisfactory passivating results. Particular notice is made of Runs 5, 19 and 27 showing the effect of air-nitrite, air alone, and hydrazine-air in combination with triethanolamine to obtain passivating. As has been previously noted, nitrite does not foster satisfactory passivation at elevated temperatures whereas the combination of hydrazine and air does provide good passivating

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results.(see table 1C and col. 11)

Concerning the claimed heat exchanger, Banks teaches the following:

This invention relates to a method of treating ferrous metal surfaces. It further relates to a method of removing deposits, including metallic oxide-containing deposits, from ferrous metal surfaces. This invention more particularly relates to a method of passivating freshly cleaned ferrous metal surfaces, such as the internal surfaces of boilers, feed water heaters, heat exchangers and similar equipment.(see col. 1, lines 1-11)

Concerning the claimed method steps and the claimed agitating step, Banks teaches the following:

Sufficient oxygen can be dissolved in the passivating solution when the solution is circulated through a centrifugal pump during normal chemical mixing.(see col. 6, lines 5-10)

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by McIntyre (US4578162).

Concerning the claimed method of removing scale, claimed heat exchanger, steam generator and the claimed scale, McIntyre teaches the following:

The pH of the iron removal solution was adjusted to pH 4.+-.0.1 using citric acid and  $\text{NH}_4\text{OH}$ , as required. The solution was pumped through a heat exchanger where its temperature was increased to about 90.degree.-95.degree. C. and was then cycled and recycled through the

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steam boiler in a manner to contact the copper-iron mixture. At least a portion of the iron in the sludge was ionized and dissolved into the solution. The solution was then removed from the steam generator. The steam generator was rinsed with the water and the copper removing solution was then used again in the manner described earlier.(see col. 5, lines 53-60)

Concerning the claimed chelant, claimed reducing agent and the claimed pH control agent, McIntyre teaches the following:

6. The method of claim 5 wherein the chelating or complexing agent is selected from the group consisting of alkali metal salts of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-hydroxyethylethylenediaminetetraacetic acid, ammonia, ammonium ions, triethanolamine and citric acid.(see claim 6)

Concerning the claimed method steps, McIntyre teaches the following:

With the steam generator vented to prevent the build up of pressure, the copper oxidant solution at ambient temperature was pumped through the steam generator in a manner to contact the copper-iron deposit. The flow rate was adjusted to about 0.5 gallon per minute. The solution was circulated through the steam generator until a portion of the copper was ionized and dissolved into the solution. The oxidant solution was then pumped into an electroplating cell. The cell had anodes and cathodes composed of nickel screens (20 mesh screens, 0.007 inch Ni wire) supported by a 1/16 inch thick nickel window-frame shaped support. Each electrode

was connected to a direct current power supply through a nickel foil electrical lead and a copper wire. The electrodes were held in place with 1/4 inch nylon nuts and 1/4 inch threaded rods. A polypropylene screen was placed between the anode and the cathode to insure that the electrodes did not physically contact each other. The DC power supply was adjusted to 50 amps. Initially the reference electrode showed a reading of -300 millivolts (mv). At this reading, residual oxidant was being decomposed. The readings slowly decreased to about -500 mv and the copper began to plate onto the cathode. As the copper ions in the solution became depleted, the readings decreased to about -900 mv. The current was then reduced to maintain the electroplating cell at a potential more anodic than about -900 mv to prevent powdering and flaking of the copper from the plates.(see col. 5, lines 10-40)

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Baum (US4632705).

Concerning the claimed method of removing scale, Baum teaches the following:

In removing ferrous material-containing deposits, an elevated temperature of about 120.degree.-135.degree. C. is used along with an initial pressure of about 2-3 atmospheres, while in removing copper-containing deposits, hydrogen peroxide or other oxidant is added to the aqueous organic cleaning agent solution and an elevated temperature of about



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30.degree.-40.degree. C. used along with an initial pressure of no higher than 0.15 atmosphere.(see col. 2, lines 40-50)

Concerning the claimed chelant, Baum teaches the following:

Cleaning agent solutions for copper deposit removal would, for example, contain EDTA, hydrogen peroxide, ammonium hydroxide, ethylenediamine and a dispersant.(see col. 6, lines 43-46)

Concerning the claimed reducing agent, Baum teaches the following:

In instances where the removal of deposits from the tubesheet crevices, those crevices between the heat transfer tubes and the tubesheet, is specifically desired, a useful solution would comprise EDTA, citric acid, ascorbic acid, hydrazine, a hydroxy substituted amine such as tetrakis (2-hydroxypropyl ethylenediamine), a surfactant, a corrosion inhibitor, and triethanolamine, in water.(see col. 5, lines 29-35)

Concerning the claimed pH control agent, Baum teaches the following:

In instances where the removal of deposits from tube support crevices, those crevices between the heat transfer tubes and tube support plates, is specifically desired, a useful solution would comprise EDTA, a corrosion inhibitor, a surfactant, and triethanolamine in water.(see col. 5, lines 35-40)

Concerning the claimed heat exchanger and the steam generator, Baum teaches the following:

FIG. 1 schematically illustrates a nuclear power plant system containing a steam generator, with fluid flow through the primary and secondary sides of the steam generator shown; and(see figure 1)

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Concerning the claimed method steps, Baum teaches the following:

6. The process as defined in claim 5 wherein said initial pressure is maintained by introducing pressurized nitrogen to the secondary side to about 0.5-1.0 atmosphere above said initial pressure.(see claim 6)

Concerning the claimed agitating step, Baum teaches the following:

Since deposits are still accumulated in the secondary side of the steam generator, flushing operations have been proposed to periodically remove as much of the dissolved impurities from the flow restricted areas as possible. Such a flushing operation may be effected by introducing a quantity of water into the secondary side of the steam generator while the pressureized water reactor system is at cold shutdown, applying a nitrogen over-pressure, heating the steam generator to about 140.degree. C. using the reactor coolant pumps, and then depressurizing the generator by opening of power-operated relief valves. The valves are subsequently closed and the cycle is repeated. Such a procedure helps to remove sludge from the tubesheet and from crevices found in the secondary side.(see col. 1, lines 40-55)

Concerning the claimed scale, Baum teaches the following:

The present invention relates to a process for cleaning of the flow restricted areas in the secondary side of a steam generator, and specifically a nuclear power plant steam generator to remove corrosion products or sludge, such as those which collect on the tubesheet, or in the tubesheet and tube support crevices.(see col. 1, lines 5-15)

Claims 1, and 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Baum (US5601657).

Concerning the claimed method of removing scale, Baum teaches the following:

7. The method of claim 1, wherein said first cleaning liquid comprises water containing a first cleaning agent for removing ferrous deposits from said surfaces and said second cleaning liquid comprises water containing a second cleaning agent for removing copper deposits.(see claim 7)

Concerning the claimed chelant, Baum teaches the following:

8. The method of claim 1, wherein said first cleaning liquid comprises water containing about 25-200 grams/liter of ammoniated EDTA.(see claim 8)

Concerning the claimed reducing agent, Baum teaches the following:

After the first cleaning liquid has solubilized a majority of the surface deposits in the heat exchanger, and preferably after a portion of the first cleaning liquid has been removed, a second cleaning liquid may be introduced 52 into the secondary side of the heat exchanger. The second cleaning liquid may be the same as, or different from, the first cleaning liquid; for example water containing EDTA in the same or a different concentration, or containing the same or different additives for example to obtain the same or different pH values. The amount of cleaning agent

used is preferably sufficient or in excess of the amount needed to solubilize a majority of the remaining deposits from the crevice regions. In nuclear steam generator applications, it may be desirable to use water containing a cleaning agent for removing ferrous deposits from the secondary side surfaces as the first cleaning liquid, and water containing a cleaning agent for removing copper deposits as the second cleaning liquid. Generally, the second cleaning liquid can be more aggressive than the first cleaning liquid, since the concern for corrosion will be lessened by the cleaning action of the first cleaning liquid. Other cleaning agents which may be used include organic acids and salts thereof, including hydroxyethylethylenediaminetriacetic acid (HEDTA), diethylenetriaminepantascetic acid (DTPA), nitrilotriacetic acid (NTA), citric acid, gluconic acid, glutamic acid, polyamines and phosphonate blends, propylenediaminetetrascetic acid (PDTA), and 1,2 cyclohexylenediaminetetraacetic acid (CYDTA).(see col. 6, lines 3-30)

Concerning the claimed heat exchanger, Baum teaches the following:

In light of the limitations of the prior art discussed above, it is an object of this invention to provide a method for cleaning heat exchangers which provides effective removal of sludge and deposits from the surfaces of the interior of a heat exchanger as well as from the crevice regions of the heat exchanger interior, and to do so without excessive corrosion or mechanical damage to the heat exchanger components.(see col. 1, lines 55-63)

Concerning the claimed agitating step, Baum teaches the following:

The second liquid is then removed from the heat exchanger in step 35.

Further steps 37 of introducing additional liquids into the heat exchanger in succession may be utilized as necessary for further cleaning and/or flushing; for example, for a copper removal step. If additional liquids are used for cleaning, the concentration of cleaning agents and/or the duration of exposure of the heat exchanger to the cleaning agent can be increased for each succeeding liquid, since the heat exchanger will become increasingly clean as total inventory of sludge and deposits is gradually removed from the heat exchanger by the successive liquids. This reduction of sludge results in a reduction of free ferric ions, thereby reducing the potential for galvanic corrosion of the heat exchanger components from the successively higher concentrations of cleaning agents.(see col. 4, lines 29-43)

Concerning the claimed scale, Baum teaches the following:

Sludge and deposit accumulations are undesirable because they interfere with the heat transfer process and because they provide low flow regions which can serve to accelerate corrosion of the heat exchanger components. Accumulated sludge and deposits may be removed from the heat exchanger during scheduled maintenance outages. Mechanical techniques for loosening the sludge are limited by the amount of force which can safely be exerted on the heat exchanger components. Chemical cleaning agents are often ineffective in penetrating the deposits located within crevice regions

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because the amount of active cleaning agent in solution is depleted by the large surface area of deposits and sludge available to the cleaning solution in the bulk volume of the heat exchanger.(see cols. 2-3)

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Rootham (US5764717).

Concerning the claimed method of removing scale and the claimed scale, Rootham teaches the following:

Chemical cleaning method for the removal of scale sludge and other deposits from nuclear steam generators(see title)

Concerning the claimed chelant and the claimed reducing agent, Rootham teaches the following:

Chemical cleaning methods were developed in the prior art to dissolve such scale and sludge accumulation, and to ameliorate corrosion. In one of these methods, the nuclear steam generator is first taken out of service and completely drained of water from both the primary and secondary sides.

Next, whereas most of the corrosion products contained in the crevice region and tube scales are iron oxide and copper and that have become tightly ensconced in the crevice regions or on the surfaces of the heat exchanger tubes, chelate-containing iron and copper removal solvents are sequentially introduced into the interior side to dissolve and remove the impurities. Such iron removal solvents typically include an aqueous

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mixture of ethylenediamine tetraacetic acid (EDTA), hydrazine, ammonium hydroxide, and an inhibitor for retarding corrosion reactions between the metal surfaces in the generator and EDTA. The copper solvent likewise includes an aqueous mixture of EDTA, ammonium hydroxide, and further includes hydrogen peroxide and ethylene diamine (EDA).(see col. 2, lines 34-52)

Concerning the claimed pH control agent, Rootham teaches the following:

in which said aqueous cleaning solution comprises a cleaning agent from at least one of the group consisting of a carrier agent and an intercalation agent, or a combination thereof, wherein said carrier agent is selected from the group consisting of dimethylamine, ethylamine, 1,2-diaminoethane, and diaminopropane, ethanolamine, 2-methyl-2-amino-1-propanol, 5-aminopentanol, and methoxypropylamine.(see claim 1)

Concerning the claimed heat exchanger and the steam generator, Rootham teaches the following:

9. The method of claim 1, in which said heat exchanger vessel is a nuclear steam generator.(see claim 9)

Concerning the claimed method steps, Rootham teaches the following:

filling said heat exchanger vessel with said cleaning solution.  
recirculating said cleaning solution within said interior of said heat exchanger vessel, and draining said cleaning solution from said vessel while continuously introducing said series of pressurized pulses during said filling, recirculating and draining steps.(see claim 7)

Concerning the claimed agitating step, Rootham teaches the following:

Pressure pulse cleaning as described induces no new, unwanted chemical corrosion of metallic surfaces at the secondary side of the steam generator, and therefore represents a substantial advance in the art.

Pressure pulse cleaning is rapidly gaining acceptance in the nuclear power industry as an alternative to chemical cleaning methods. But, while pressure pulse cleaning is capable of removing a great deal of sludge and deposits, it is rarely effective in removing the tightly ensconced deposits that accumulate in the crevice regions of the generator. Sludge lancing is often performed on the tubesheet regions prior to pressure pulsing to remove larger accumulations of sludge and deposits on the top of the tubesheet. Sludge lancing is also performed after the pressure pulsing operation has been completed to remove loosened deposits that have fallen out of solution into the tubesheet. Unfortunately, such sludge lancing adds to both the time and expense of the pressure pulsing cleaning operation.(see col. 3)

### *Conclusion*

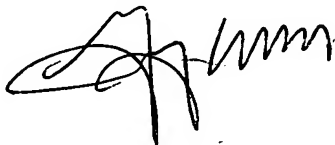
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglass McGinty can be reached on (571)272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Gregory E. Webb', with a stylized, cursive script.

Gregory E. Webb  
Primary Examiner  
Art Unit 1751

gew